Claim 21, line 4, and please delete the word, "bulky."

Claim 28, line 3, please delete the term, "bulky ligand."

Claim 28, line 4, please delete the term, "bulky ligand."

Claim 52, line 2, please delete the term "-type."

Claim 53, line3, please delete the term "-type."

Claim 54, line 1, please delete the term "bulky ligand."

REMARKS

Reconsideration of the above-identified application in view of the above amendments and remarks following is respectfully requested.

Claims 10-14, 16-23, 25-32 and 51-57 are before the Examiner.

Claims 10, 12, 13, 20, 21, 22, 28 and 52-54 have been amended. The amendments to the claims neither present new matter nor raise new issues but merely satisfy the Examiner's concerns under 35 U.S.C. 112. Entry of the amendment is therefore respectfully requested.

As discussed in Applicants' response mailed January 11, 2000, it is been well known in the art that hafnocene catalysts obtain high molecular weight polymer product, but manifest relatively poor activity as compared with the titanocene and zirconocene catalyst systems. There has been a long felt need for a hafnocene catalyst system that would not only obtain the highly desirable high molecular weight polymer product, but would also do so in accordance with a process that manifests high activity. In accordance with Applicants' invention it has been discovered that hafnocene based catalyst systems containing the claimed alkyl substituents on the ligand manifest highly improved activity. It is respectfully submitted to be highly unexpected that the improved activity is obtained. It is respectfully believed there is nothing in the art that would lead one of ordinary skill to predict that by placing the claimed alkyl groups on the ligand(s) of a hafnocene catalyst that the activity would greatly increase. Table 1 found on page 24 of the Applicant's specification shows that the catalysts in accordance with the claimed invention obtain activities that are about 50 times greater and yields that are about 10 to 20 times greater as compared with hafnocenes not in accordance with the claimed invention. The unexpectedness and unobviousness is all the more clear when one notes that the improved activity and yields were obtained without a loss in high molecular.

Claims 20, 52 and 53 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In view of the amendment to the claims,

which amendment deleted all occurrences of the word "type" to facilitate prosecution, withdrawal of the rejection is respectfully requested.

Claims 10, 11, 14, 16-19, 21-23, 25, 26, 28-31, 51 and 55-57 have been rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants respectfully submit that the ordinary person in the art would not be confused by the word "bulky." The claims as addressed to chemists are deemed to be clear. In any event, in order to facilitate prosecution applicants have deleted the word "bulky" from all the claims in this case. Withdrawal of the rejection is respectfully requested.

Claims 10-12, 14, 16, 19, 28-30, 51, 52, 55 and 56 have been rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,621,054 to Harrington (Harrington). This rejection is respectfully traversed. As discussed above, it is submitted that the unobviousness with respect to the invention is the fact that the hafnocene catalyst discovered manifests high activity. It is submitted that the examples in Harrington support the unobviousness of the instant claimed invention. When one compares the working examples of Harrington one observes that the activity for the zirconcenes and titanocenes is much greater than the activity for the hafnocenes. The hafnocene activity is very low. For Example 1 the yield was high, however, the amount of norbornene was employed was higher than that in the remaining Examples and the amount of catalyst employed was greater than the Examples employing the zirconocene or titanocene catalysts. From Harrington alone one of ordinary skill in the art learns that hafnocenes with respect to both activity and molecular weight are not a catalyst of choice. The Examples in the instant application demonstrate unexpectedly a very high activity. From the teachings and disclosure of Harrington, one of ordinary skill in the art could not predict the results as unequivocally demonstrated in the instant application.

Contrary to the Examiner's suggestion, nowhere within the four corners of Harrington is there any statement wherein the "patentee clearly states that common alkyl groups are satisfactory for use at the required substitution site." The patentee does state "any C_1 or higher carbon number or alkyl substituted silyl substituent having at least one carbon atom can be used ...". Many more substitutions are described in the column and lines of Harrington cited by the Examiner.

It is respectfully submitted that the Examiner has arrived at a conclusion without supportive evidence. Harrington does not single out the t-butyl substituent but in fact states that the tert-butyl substituted hafnocene ..."exemplifies the class of compounds suitable in this invention" (Column 3, lines 66 and 67) and then goes on to list all the substituents available in the column and lines cited by the Examiner. The conclusion that, "One of ordinary skill in the art would be motivated to use simple linear or branched alkyl substituents of common $C_3 - C_{10}$ linear or iso alkyl group, because the patentee has stated that such use results in effective polymerization" has not been supported by any evidence excepting the Examiner's own position. It is respectfully stated that this conclusion is in error because of all the possible substituents found in Column 4, lines 16 to 32. Why one of ordinary skill in the art would be particularly led to Applicant's

claimed substituents in view of the multitude of substituents disclosed has not been explained by the Examiner. It is respectfully requested that the Examiner has not provided any evidence that would support the specific selection from the multitude of substituents presented in Harrington. In addition, Harrington does not list a single metallocene having a linear or iso alkyl substituent on the ligand, and Harrington does not address activity. In view of the above, it is respectfully submitted that the Examiner has not established a prima facie case of obviousness and that this rejection be withdrawn.

Applicant has unequivocally demonstrated unexpected results in that the invention as claimed obtains activities that are about 40 to 50 times greater than the catalysts comprising substituents outside the claimed substituents. Also, in view of this it is respectfully asked that the rejection over Harrington also be withdrawn.

Claims 10-14, 16, 17, 20, 27-32 51-54, 56 and 57 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,387,660 to Doyle et al. (Doyle). This rejection is respectfully traversed. As in Harrington discussed above, the Examiner arrives at a very specific conclusion from a very broad disclosure. The Examiner should not only recite Column 3, lines 51-53, but should also include line 51-60. By reading the complete disclosure one notes that the only group recited is "methyl".

Once again it is respectfully submitted that the evidence the Examiner relies on is his own conclusion not based on the teachings of Doyle. Just because there are "15" possible structural isomers corresponding to C1-C5 alkyl group some of which would include iso and linear group is not evidence. Based on the total disclosure by Patentee, it is urged that the number of possible isomers would no more suggest Applicants' claimed substituents than it would suggest substituents outside of those recited in the instant claims. It is respectfully submitted that the Examiner's position regarding the number of isomers is merely an invitation to try, a standard that does not raise the issue of obviousness. The attempt at providing motivation is at most weak. The Examiner again reaches a conclusion that does not appear in Doyle. Doyle does not recite iso or linear and does not exemplify or list iso or linear groups. It is respectfully suggested that the Examiner errs in stating that Doyle "has set forth a group of substituents which substantially overlaps with the group specified in the instant claims."

Again, the Examiner is referred to the Examples in Applicants' specification. The Examples that cover catalysts within the scope of the claims demonstrate superior activity over the examples, which recite catalysts outside the scope of the claims. Please note that the comparison examples in this case employ a methyl group, the only named group in Column 3, lines 50 to 60 of Doyle. In view of the above, withdrawal of the rejection is respectfully requested.

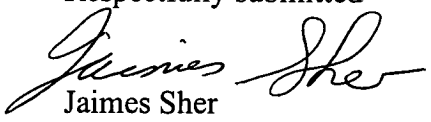
Claims 10-14, 16-23, 25, 26, 28-31 and 51-57 have been rejected under 35 U.S.C.103(a) as being unpatentable over U.S. Patent No. 5,281,679 to Jejelowo et al. (Jejelowo). This rejection is respectfully traversed.

It is respectfully submitted that one of ordinary skill in the art would take judicial notice that the hafnocene catalysts (prior to Applicants' invention) produced high molecular weight polymer product but did so at a very slow catalytic activity. The Examples in this case go against that which was understood by the ordinary practitioner in the art. It is respectfully submitted that the ordinary practitioner would neither predict nor expect the substantial increase in activity that Applicants have demonstrated in the Examples over the catalysts not within the scope of the claimed invention. Applicants have demonstrated the importance with respect to the iso and linear substituents for hafnocenes as claimed. The MPEP at the Column cited by the Examiner states that if the Applicant has demonstrated the criticality of a specific limitation, it would not be appropriate to rely solely on case law as the rationale to support an obviousness rejection. The numerous cases the Examiner alludes to do not hold that a broad, indefinite disclosure makes obvious a specific, definite recitation of a claimed invention. Furthermore, Jejelowo supports the unobviousness of Applicants' invention. The Examiner has pointed to the Examples at Column 17 and 18. Please note that the Examples having the substituents that fall within the definition of Applicants' substituents evidence lower activity than the remaining examples. For example, a compound using a t-butyl obtains a catalyst rate of 0.671, 1.001 and 0.92,1 whereas the compounds using iso-propyl obtains catalyst rates of 0.158, 0.225, 0.233. An ordinary practitioner in the art reading such a disclosure would not be motivated to Applicants' substituents, naturally expecting to obtain lower activities. In view of the above, withdrawal of the rejection is respectfully requested.

Claims 18, 19, 21-23, 25 and 26 have been rejected as unpatentable over Doyle, optionally in view of U.S. Patent No. 5,714,426 to Tsutsui et al (Tsutsui). This rejection is respectfully traversed. The Examiner states that Doyle discusses all aspects of the claimed invention except for the use of a supported catalyst and the use of gas phase conditions. Once again, it is respectfully asked where Doyle discusses all aspects of the claimed invention. Doyle does not discuss increasing catalytic activity of hafnocenes by use of the substituents recited in the instant claims. Doyle does not mention a single substituent in the general disclosure except for methyl. In the examples of Doyle the only substituents employed are methyl and t-butyl, both being outside the scope of Applicants' claimed invention. It should also be noted that Tsutsui lists many hafnocenes Tsutsui does not list hafnocenes that falls within the definition of Applicants' claimed invention. In any event, Tsutsui do not solve the deficiency in Doyle. At most, one would employ the process conditions of Tsutsui with the catalyst systems of Doyle. Thus, withdrawal of this rejection is respectfully requested.

In view of the above amendments and remarks it is respectfully submitted that this application is in condition for allowance. Prompt notice of allowance is respectfully solicited.

Respectfully submitted



Jaimes Sher
Registration No. 34,726

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